



On some new double haloid salts

M. Poggiale

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Spot, $4^{\circ}\frac{3}{4}$.
Sun, 5° .

Sun, $1^{\circ}\frac{1}{4}$.
Spot, 0° .

The change in the temperature during the intervals of observation, is due to the variations in the temperature of the room differently affecting the two extremities of the pile.

In consequence of cloudy weather, another set of observations were not obtained until the 10th of January, and at this time the spot had very much changed its appearance; the penumbra, while it retained its dimensions in one direction, was much narrowed in the other, and the dark part was separated into two small ones; also the sky was not perfectly clear, and therefore the results were not as satisfactory as those of the previous observations; the indications were, however, the same as in the other sets, exhibiting a less degree of heat from the spots.

Cloudy weather prevented other observations on the heat of different parts of the sun, particularly a comparison between the temperature of the centre and the circumference of the disc, which would have an important bearing on the question of an atmosphere of the sun. The observations will be continued, and any results of interest which may be obtained will be communicated to the Society.

METHOD OF PURIFYING OXIDE OF URANIUM FROM NICKEL, COBALT AND ZINC. BY PROF. WOHLER.

When the oxide of uranium, in its preparation from the pitchblende, has been so far purified as to be dissolved in carbonate of ammonia, sulphuret of ammonia is carefully and gradually mixed with the solution as long as a black precipitate falls. In this way nickel, cobalt and zinc are entirely separated, without any uranium being thrown down.—*Liebig's Annalen*, Oct. 1845.

ON SOME NEW DOUBLE HALOID SALTS. BY M. POGGIALE.

Protochloride of Antimony and Chloride of Ammonium.—The protochloride of antimony combines with chloride of ammonium in two proportions. When protochloride of antimony is added to a solution of that salt, it dissolves readily, and only a slight turbidness, arising from the formation of some oxychloride, is perceptible. On evaporating the liquid at a gentle heat, at first beautiful rectangular prisms are obtained, and subsequently hexahedrons or hexahedral pyramids. The first are $3\text{NH}^3\text{HCl}$, $\text{SbCl}^3 + 3\text{HO}$, and the latter $2\text{NH}^3\text{HCl}$, $\text{SbCl}^3 + 2\text{HO}$. Both salts are colourless and transparent; they become yellow and opaque in moist air, but are very permanent in dry air, and are coloured yellow in the mother-ley when heated; they are likewise decomposed by a large quantity of water.

Protochloride of Antimony and Chloride of Potassium.—This salt is deliquescent, becomes yellow on exposure to the air, is decomposed by water and also by heat; it forms laminar crystals, the composition of which is 3KCl , SbCl^3 . The mother-ley yields, on spontaneous evaporation, hexahedral crystals of 2KCl , SbCl^3 .

Protochloride of Antimony and Chloride of Sodium forms laminar crystals, having the composition $3\text{NaCl}, \text{SbCl}^3$.

Protochloride of Antimony and Chloride of Barium.—When the solution of the chloride of barium is very dilute, the two salts separate on cooling; the chloride of barium crystallizes in tablets, while the protochloride of antimony decomposes the water. It is therefore necessary, in order to obtain this compound, to use concentrated solutions. It is obtained in minute radiately-grouped needles, the composition of which is represented by $2\text{BaCl}, \text{SbCl}^3 + 5\text{HO}$. The protochloride of antimony combines in the same way with chloride of strontium, chloride of calcium, and chloride of magnesium.

Protochloride of Tin and Chloride of Ammonium forms beautiful fascicular needles, which are permanent in the air, but are decomposed by water. The analysis of this salt, which had been previously obtained by Jacquelin, gave the formula $2\text{NH}^3, \text{SnCl}, \text{HCl} + 3\text{HO}$.

Protochloride of Tin and Chloride of Potassium is obtained by direct combination of the two salts, and crystallizes in beautiful long needles, which are isomorphous with the preceding salts. Its formula is $2\text{KCl}, \text{SnCl} + 3\text{HO}$.

Protochloride of Tin and Chloride of Barium yields, on spontaneous evaporation, beautiful prisms, the *protochloride of tin and chloride of strontium* long needles. They are represented by the formulæ $\text{BaCl}, \text{SnCl} + 4\text{HO}$ and $\text{SrCl}, \text{SnCl} + 4\text{HO}$.

Chloride of Sodium and Magnesium consists of $\text{NaCl}, 2\text{MgCl} + 2\text{HO}$.

Iodide of Silver and Ammonium.—Iodide of ammonium dissolves iodide of silver, forming with it a deliquescent double salt. It contains $2\text{NH}^3, \text{HI}, \text{AgI}$.

Iodide of Lead and Sodium crystallizes in yellow shining laminae. It is obtained by adding a slight excess of iodide of sodium to a hot solution of iodide of lead, and placing the liquid in a warm spot. Its formula is $\text{NaI}, 2\text{PbI}$.

Iodide of Zinc and Sodium yields, on spontaneous evaporation, prismatic radiately-grouped needles. It is colourless, readily soluble in water and deliquescent. Its formula is NaI, ZnI .

Chloride and Iodide of Lead is obtained by dissolving iodide of lead in a solution of chloride of ammonium. On cooling, numerous yellowish crystals separate, which assume the form of needles, and consist of $\text{PbI}, 2\text{PbCl}$. On evaporating the mother-ley, crystals are obtained of $2\text{NH}^3 \text{HCl}, \text{PbI} + 2\text{HO}$, in the form of minute, silky, ramified needles; they become yellow in the air, and are decomposed by water.

Chloride and Acetate of Lead.—This is formed when chloride of lead is boiled in a porcelain dish with teracetate of lead, to which subsequently a slight addition of acetic acid is made. The solution is evaporated at a gentle heat, when colourless shining crystals separate on cooling. The salt has a sweetish astringent taste, effloresces readily in the air, and melts at 180° ; it loses its water of crystallization at 228° . The salt is readily soluble in water; alcohol

decomposes it, and precipitates chloride of lead. Several analyses yielded the formula PbCl , $5\text{PbO C}^4 \text{H}^3 \text{O}^3 + 15\text{HO}$.

Iodide and Carbonate of Lead is prepared by digesting carbonate of lead with iodide of lead until the excess of iodide of lead has dissolved. This salt is yellow and insoluble in water. Its formula is PbI , PbO , CO^2 .—*Comptes Rendus*, p. 1180.

ON THE VOLATILE ACIDS OF CHEESE. BY MM. ILJENKO AND LASKOWSKI.

The authors cut fifty pounds of Limbourg cheese, which possessed a very strong odour, into small pieces, mixed them with water, and submitted the mixture to distillation in a large alembic, water being occasionally added during several days. By this operation a somewhat turbid ammoniacal liquor was obtained, which was supersaturated with sulphuric acid and again distilled. The product was afterwards saturated with barytes water; the salt obtained was evaporated to its crystallizing point; the acid was again separated and converted into a salt of silver. Analysis showed that this volatile acid was entirely valerianic acid.

The residue was afterwards saponified by means of potash, the soap decomposed by potash, and subjected to a fresh distillation, and there was thus obtained an acid liquid which was saturated with barytes and evaporated to crystallize; it yielded a mixture of several salts of barytes, which were separated by means of their different solubility in water. The rough salt was mixed with seven parts of water and heated to boiling; the caproate of barytes dissolved, and afterwards separated in crystalline tufts of considerable size, whilst the butyrate remained in solution; this was converted into a salt of silver and analysed.

The barytic salts, which were not dissolved by the seven parts of boiling water, were composed of caproate and caprylate of barytes; and they also were separated by their different solubility.

It appears then that cheese contains the following volatile acids:

Butyric acid	$\text{C}^4 \text{H}^8 \text{O}^2$
Valerianic acid. . .	$\text{C}^5 \text{H}^{10} \text{O}^2$
Caproic acid. . . .	$\text{C}^6 \text{H}^{12} \text{O}^2$
Caprylic acid . .	$\text{C}^8 \text{H}^{16} \text{O}^2$
Capric acid	$\text{C}^{10} \text{H}^{20} \text{O}^2$

Valerianic acid occurs in the largest quantity, and its presence had been previously discovered by M. Balard in the cheese of Roquefort. All these acids, it will be observed, are homologous substances.

The authors also performed some experiments on the fused portion of cheese; they obtained by means of boiling alcohol perfectly crystalline margarine from it; it was fusible at 127°Fahr. , and margaric acid was obtained from it. The rough margarine was mixed with some liquid glycerine. Unaltered caseine was also present, soluble in boiling water and insoluble in alcohol. There was also pre-